REMARKS

Claims 1-18 are all the claims pending in the application. Claim 1 has been amended based on, for example, pages 13-14 and 18-29 of the specification.

Entry of the above amendments is respectfully requested.

I. Information Disclosure Statement

In the Office Action, the Examiner asserts that the Information Disclosure Statement filed July 14, 2004 fails to comply with 37 C.F.R. § 1.98(a)(2) because a legible copy of each cited foreign patent document and non-patent literature publication, or other information was not provided.

It is respectfully submitted that the present application is a §371 application of PCT/FR03/000888 filed on January 13, 2003, and it was believed that the references cited on the PTO/SB/08 A & B (modified) would be forwarded by the International Bureau since the references appear to have been submitted to the International Bureau. *See* attachment. However, Applicants will submit copies of the references in due course.

II. Rejection of Claims 1-18 under 35 U.S.C. § 103(a)

Claims 1-5, 7, 17, and 18 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent 4,925,500 (Kishida et al.; US '500).

In addition, claims 1-5, 7, and 9-18 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent 4,961,793 (Kishida et al.; US '793).

Further, claims 6, 8, and 13 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over US '500 or US 793 in view of U.S. Patent 6,676,774 (Matsuoka et al.).

Applicants respectfully traverse the rejections.

The present invention according to claim 1 is directed to a process for manufacturing a steel product made of copper-rich carbon steel, wherein: a liquid steel is produced, which has

the following composition, expressed as percentages by weight: * 0, 0005% ≤ C ≤ 1%; * 0.5 ≤ Cu ≤ 10%; * 0 ≤ Mn ≤ 2%; * 0 ≤ Si ≤ 5%; * 0 ≤ Ti ≤ 0.5%; * 0 ≤ Nb ≤ 0.5%; * 0 ≤ Ni ≤ 5%; * 0 ≤ Al ≤ 2%; the remainder being iron and impurities resulting from production; this liquid steel is cast directly into the form of a thin strip having a thickness less than or equal to 10 mm; the strip is cooled rapidly to a temperature less than or equal to 1000°C by spraying with water or a water/air mixture; the thin strip is subjected to hot-rolling at a reduction rate of at least 10%, the end-of-rolling temperature being such that, at this temperature, all the copper is still in a solid solution in the ferrite and/or austenite matrix; the strip is subjected to forced cooling so as to keep the copper in a supersaturated solid solution in the ferrite and/or austenite matrix; and the strip thus cooled is coiled. In the present invention, the strip cooling is performed by spraying it with water or a water-air-mixture (so as to obtain sufficiently quick a cooling), and the strip is coiled just after is has been forced cooled after having been hot rolled.

According to the Examiner, US '500 discloses a sheet making process for sheets containing copper by thin strip casting, cooling, hot rolling and coiling while keeping Cu in solution during coiling.

Applicants respectfully disagree.

US '500 does not disclose, teach or suggest performing a quick cooling step of the cast products down to 1000° C or below before hot rolling, as recited in claim 1. US '500, at column 7, lines 40 to 66 and column 8, lines 1 to 11, to which the Examiner refers, show that the steel of US '500 is produced from a classical thick slab, rolled directly or after a reheating. The high cooling speeds required by the subvention of the present invention could not be reached in this process. The slabs of US '500 are about 200 mm thick before they are hot-rolled, and it would not be possible to reach the high cooling speeds required for maintaining Cu in a solid solution in the ferrite and/or austenite matrix after hot rolling.

Thus, the hot rolling performed on a thick slab in US '500 unavoidably would have different effects on the steel and result in a product structurally different from the product of the present invention, even if their final thicknesses were similar.

In addition, transposing a cooling-rolling-coiling process known for classical slabs to directly cast thin strips would not be obvious.

Initially, the structure of these types of products are completely different. A directly cast thin strip (some mm thick) is obtained by joining at the level of the nip separating the two rotating casting rolls, the two skins formed on the roll surfaces, which are already nearly entirely solidified when they are joined. When a thicker product is cast into slabs in a classical continuous casting machine having walls which do not accompany the product during its solidification, the solidification is much more progressive. It is not completed, yet, when the product leaves the mold; the core of the product is still in the liquid state. This leads to final solidificated structures completely different in both cases, particularly in the core of the material.

Also, the metallurgical treatments which will follow the casting of the product will not have the same effects on a thin strip and on a thick product.

Moreover, a thick product must undergo a hot rolling at a far higher reduction rate than a thin product for obtaining a similar final thickness. This, also, has a strong influence on the final structure of the product, and on the way it will react during posterior treatments.

In sum, one of ordinary skill in the art would not expect a metallurgical process, which is known for having a beneficial effect on a semi-finished product obtained by a classical thick slab casting process, to have the same beneficial effects on a thick strip obtained by direct casting from liquid metal. Thus, one of ordinary skill in the art would not modify transposing a cooling-rolling-coiling process known for classical slabs to directly cast thin strips, and the process

would not be performed without thin adaptations of the casting and thermo-mechanical treatments conditions.

For the above reasons, it is respectfully submitted that US '500 does not teach or suggest the present invention according to claim 1.

Regarding US '793 and US '774, these references also are directed to classical continuous casting of thick products. Therefore, these references do not disclose, teach or suggest the present invention according to claim 1 for the same reasons as US '500. These references also do not make up for any deficiencies of US '500, and thus, even if the references were somehow combined, the combination would not result in the present invention. In particular, neither reference discloses, teaches, nor suggests performing a quick cooling step of the cast products down to 1000° C or below before hot rolling, as recited in claim 1.

In view of the above, it is respectfully submitted that the cited references, alone or in combination, fail to teach or suggest claim 1.

Thus, it is respectfully submitted that claim 1 and the claims depending therefrom, are patentable over the cited art.

Accordingly, withdrawal of the rejection is respectfully requested.

III. Conclusion

For the foregoing reasons, reconsideration and allowance of claims 1-18 is respectfully requested.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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WASHINGTON OFFICE
23373
CUSTOMER NUMBER

Date: November 26, 2007 (timely filed, November 24, 2007 being a Saturday)

EP1466024 - METHOD FOR THE PRODUCTION OF A SIDERURGICAL PRODUCT MADE OF CARBON STEEL WITH A HIGH COPPER CONTENT, AND SIDERURGICAL PRODUCT OBTAINED ACCORDING TO SAID METHOD - ARCELOR France

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Status: Patent has been granted
Database last updated on: 22/11/2007

Most Recent Event: 22/06/2007 (Expected) Grant published on 25/07/2007 [2007/30]

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Application No., filing date:
03712234.8 13/01/2003
[2004/42]

WO2003FR00088

Priority No., dates:
FR20020000387 14/01/2002
[2004/42]

Filing language: FR

Procedural language: FR

Publication:
Type: A1 Application with search report
No.: EP1466024
Date: 17/07/2003
[2004/42]

	Type:	
	No.:	WO03057928
	Date:	17/07/2003
	[2004/42]	
	Type:	B1 Patent Specification
	No.:	EP1466024
	Date:	25/07/2007
	[2007/30]	
International search report:	Date:	17/07/2003
	Authority:	EP
Classification:	international:	C21D8/04, C22C38/16, C22C38/04 [2004/42]
Designated Contracting States:	AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LI, LU, MC, NL, PT, SE, SI, SK, TR [2004/42]	
Title	German	VERFAHREN ZUR HERSTELLUNG EINES EISENHÜTTENPRODUKTS AUS UNLEGIERTEM STAHL MIT HOHEM KUPFERGEHALT UND DANACH ERHALTENES EISENHÜTTENPRODUKT [2004/42]
	English	METHOD FOR THE PRODUCTION OF A SIDERURGICAL PRODUCT MADE OF CARBON STEEL WITH A HIGH COPPER CONTENT, AND SIDERURGICAL PRODUCT OBTAINED ACCORDING TO SAID METHOD [2004/42]
	French	PROCEDE DE FABRICATION D UN PRODUIT SIDERURGIQUE EN ACIER AU CARBONE RICHE EN CUIVRE, ET PRODUIT SIDERURGIQUE AINSI OBTENU [2004/42]
Application is treated in (/fax-nr)	MUNICH/(+49-89) 23994465	
Entry into regional phase:	12/07/2004	Designation fee(s) paid
	12/07/2004	Examination fee paid
	12/07/2004	National basic fee paid
Examination procedure:	12/07/2004	Request for examination was made [2004/42]
	10/11/2005	Dispatch of examination report (Time limit: M04)
	16/01/2006	Reply to examination report
	01/06/2006	Dispatch of examination report (Time limit: M04)
	04/10/2006	Reply to examination report
	26/02/2007	Communication of intention to grant the patent
	08/06/2007	Fee for grant paid
	08/06/2007	Fee for printing paid
Fees Paid:	**Renewal fee(s)**	
	12/07/2004	Renewal fee patent year 03
	16/01/2006	Renewal fee patent year 04
	16/01/2007	Renewal fee patent year 05

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